

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application of: Amin et al

Confirmation No.: 2156

Serial No.: 09/839,636

Group Art Unit: 2881

Filed: April 20, 2001

Examiner: Not Yet Assigned

For: QUANTUM BIT WITH A  
MULTI-TERMINAL JUNCTION AND  
LOOP WITH A PHASE SHIFT

Attorney Docket No.: 11090-035-999

**INFORMATION DISCLOSURE STATEMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, there is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the application.

1. Enclosures accompanying this Information Disclosure Statement are:

- 1a. ☒ A list of all patents, publications, applications, or other information submitted for consideration by the office.
- 1b. A legible copy of :
  - ☒ Each U.S. patent application publication and U.S. and foreign patent;
  - ☒ Each publication or that portion which caused it to be listed on the PTO-1449;
  - ☐ For each cited pending U.S. application, the application specification including the claims, and any drawing of the application, or portion of the application which caused it to be listed on the PTO-1449 including any claims directed to that portion;
  - ☐ all other information or portion which caused it to be listed on the PTO-1449.
- 1c. ☐ An English language copy of search report(s) from a counterpart foreign application or PCT International Search Report.
- 1d. ☐ Explanations of relevancy (ATTACHMENT 1(d), hereto) or English language abstracts of the non-English language publications.

2. ☒ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b):

- ☐ Within three months of the filing date of a national application other than a continued prosecution application under §1.53(d);
  - ☐ Within three months of the date of entry of the national stage as set forth in §1.491 in an international application;
  - ☒ Before the mailing of the first Office action on the merits;
  - ☐ Before the mailing of a first Office action after the filing of a request for continued examination under §1.114.
3. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(c) after the period specified in 37 C.F.R. §1.97(b), but before the mailing date of any of a final action under 37 C.F.R. §1.113, a notice of allowance under 37 C.F.R. §1.311 or an action that otherwise closes prosecution in the application.

*(Check either Item 3a or 3b)*

- 3a. ☐ The Certification Statement in Item 5 below is applicable. Accordingly, no fee is required.
- 3b. ☐ The \$180.00 fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is:
- ☐ enclosed
  - ☐ to be charged to Pennie & Edmonds LLP Deposit Account No. 16-1150.

*(Item 3b to be checked if any reference known for more than 3 months)*

4. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(d) after the period specified in 37 C.F.R. §1.97(c), but on or before the date of payment of the issue fee.

The \$180.00 fee set forth in 37 C.F.R. §1.17(p) is:

- ☐ enclosed.
- ☐ to be charged to Pennie & Edmonds LLP Deposit Account No. 16-1150.

The Certification Statement in Item 5 below is applicable.

5. ☐ Certification Statement *(applicable if Item 3a or Item 4 is checked)*

*(Check either Item 5a or 5b)*

- 5a. ☐ In accordance with 37 C.F.R. §1.97(e)(1), it is certified that each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.
- 5b. ☐ In accordance with 37 C.F.R. §1.97(e)(2), it is certified that no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the undersigned after making reasonable inquiry, was known by any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this Information Disclosure Statement.
6. ☐ This application is a continuation application under 37 C.F.R. §1.60 or §1.53(b) or (d).

(Check appropriate Items 6a, 6b and/or 6c)


- 6a. ☐ A Petition to Withdraw from issue under 37 C.F.R. §1.313(b)(5) is concurrently filed herewith.
- 6b. ☐ Copies of publications listed on Form PTO-1449 from prior application Serial No. \_\_, filed on \_\_, of which this application claims priority under 35 U.S.C. §120, are not being submitted pursuant to 37 C.F.R. §1.98(d).
- 6c. ☐ Copies of the publications listed on Form PTO-1449 were not previously cited in prior application Serial No. , filed on , and are provided herewith.
7. ☐ This is a Supplemental Information Disclosure Statement. (Check either Item 7a or 7b)
- 7a. ☐ This Supplemental Information Disclosure Statement under 37 C.F.R. §1.97(f) supplements the Information Disclosure Statement filed on \_\_. A bona fide attempt was made to comply with 37 C.F.R. §1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental Information Disclosure Statement can be considered as if properly filed on \_\_.
8. ☐ In accordance with 37 C.F.R. §1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:

( Check Item 8a, 8b, or 8c)

- 8a. ☐ satisfied because all non-English language publications were cited on the enclosed English language copy of the PCT International Search Report or the search report from a counterpart foreign application indicating the degree of relevance found by the foreign office.
- 8b. ☐ set forth in the application.
- 8c. ☐ enclosed as an attachment hereto.
9. ☒ The Commissioner is authorized to charge any additional fee required or credit any overpayment for this Information Disclosure Statement and/or Petition to Pennie & Edmonds LLP Deposit Account No. 16-1150.
10. ☒ No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date: March 6, 2003

  
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31,066  
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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)				Application Number	09/839,636
				Filing Date	April 20, 2001
				First Named Inventor	Mohammad Amin
				Art Unit	2822
				Examiner Name	Unknown
Sheet	1	of	2	Attorney Docket Number	11090-035-999

## U.S. PATENT DOCUMENTS

Examiner Initials	Cite No. <sup>1</sup>	Document Number Number - Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	BA	US-6,495,854 B1		D.M. Newns, and C.C. Tsuei	
	BB	US-6,459,097 B1		A. M. Zagoskin	
	BC	US-6,504,172 B2		A. M. Zagoskin et al.	
		US-			
		US-			
		US-			
		US-			

## FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No. <sup>1</sup>	Foreign Patent Document Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>

## OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)

BD	R. de Bruyn Ouboter, A.N. Omelyanchouk, and E.D. Vol, "Multi-terminal SQUID controlled by the transport current", <i>Physica B</i> , Vol. 205, pp. 153-162 (1995).
BE	R. de Bruyn Ouboter and A.N. Omelyanchouk, "Four-terminal SQUID: Magnetic Flux Switching in Bistable State and Noise", <i>Physica B</i> , Vol. 254, pp. 134-140 (1998).
BF	R. de Bruyn Ouboter, A.N. Omelyanchouk, and E.D. Vol, "Dynamical properties of the Josephson multiterminals in an applied magnetic field", <i>Physica B</i> , Vol. 239, pp. 203-215 (1997).
BG	R. de Bruyn Ouboter, A.N. Omelyanchouk, and E.D. Vol, "Magnetic flux locking in two weakly coupled superconducting rings", ArXiv.org: cond-mat/9805174, pp. 1-10 (1998), website last accessed on January 16, 2002.



BH	J.P. Heida, B.J. van Wees, T.M. Klapwijk, and G. Borghs, "Nonlocal supercurrent in mesoscopic Josephson junctions", <i>Physical Review B</i> , Vol. 57, pp. R5618–R5621 (1998).
BI	J. P. Heida, B. J. van Wees, T. M. Klapwijk, and G. Borghs, "Critical currents in ballistic two-dimensional InAs-based superconducting weak links", <i>Physical Review B</i> , Vol. 60, pp. 13135–13138 (1999).
BJ	Lev B. Ioffe, Vadim B. Geshkenbein, Mikhail V. Feigel'man, Alban L. Fauchère, and Gianni Blatter, "Environmentally decoupled sds-wave Josephson junctions for quantum computing", <i>Nature</i> , Vol. 398, pp. 679–681 (1999)
BK	Urs Ledermann, Alban L. Fauchère, and Gianni Blatter, "Nonlocality in mesoscopic Josephson junctions with strip geometry", <i>Physical Review B</i> , Vol. 59, pp. R9027–R9030 (1999).
BL	K.K. Likharev, "Superconducting weak links", <i>Reviews of Modern Physics</i> , Vol. 51, pp. 101, 102, 146–147 (1979).
BM	Y. Makhlin, G. Schön, and A. Shnirman, "Quantum-State Engineering with Josephson-Junction Devices", <i>Reviews of Modern Physics</i> , Vol. 73, pp. 357–400 (2001).
BN	P. Samuelsson, Å. Ingeman, V.S. Shumeiko, and G. Wendin, "Nonequilibrium Josephson current in ballistic multiterminal SNS-junctions", ArXiv.org: cond-mat/0005141, pp. 1–12 (2000), website last accessed January 30, 2003.
BO	Qing-feng Sun, Jian Wang, and Tsung-han Lin, "Control of the supercurrent in a mesoscopic four-terminal Josephson junction", <i>Physical Review B</i> , Vol. 62, pp. 648–660 (2000).
BP	D.A. Wollman, D.J. Van Harlingen, J. Giapintzakis, and D.M. Ginsberg, "Evidence for $d_{x^2-y^2}$ Pairing from the Magnetic Field Modulation of YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7</sub> -Pb Josephson Junctions", <i>Physical Review Letters</i> , Vol. 74, pp. 797–800 (1995).
BQ	Malek Zareyan and A.N.Omelyanchouk, "Coherent Current States In Mesoscopic Four-Terminal Josephson Junction", ArXiv.org: cond-mat/9811113, pp. 1–17 (1998).
Examiner Signature	Date Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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